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BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

AUG 23 1991

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)

Petition to Amend Part 68 of the)
Commission's Rules to Include Terminal)
Equipment Connected to Basic Rate)
Access Services Provided via)
Integrated Services Digital Network)
Access Technology)

93-268

RM-78.5

PETITION FOR RULEMAKING

Southwestern Bell Telephone Company (Southwestern Bell), by its attorneys, and pursuant to Section 1.104, et seq., of the Rules¹ of the Federal Communications Commission (Commission), respectfully requests that the Commission amend Part 68 of its Rules as proposed herein to include terminal equipment connected to two wire Basic Rate Access interface provided by the Integrated Services Digital Network (ISDN) access technology. The proposed amendments are necessary to extend the scope of the present rules and to add specific technical specifications to protect the network from harm. Adoption of the proposed rules will foster uniform industry standards for ISDN and will support world wide compatibility.

¹47 C.F.R. Section 1.104 et seq..

BACKGROUND

ISDN is an integrated access technology which currently is designed to provide both basic and primary rate digital access.² Basic Rate Access (BRA) has been defined as a standardized combination of digital access channels that constitute the access arrangement in any of the following combinations: (1) one D channel, (2) one B channel plus one D channel or (3) two B channels plus one D channel. Only the two wire BRA interface is addressed in this Petition.

During the past several years, the telecommunications industry has been engaged in a multifaceted approach to the development of ISDN. Both national and international standards bodies³ have been addressing the standardization of ISDN to evolve toward ensuring worldwide interworking compatibility.⁴ Manufacturers have undertaken research and development of equipment based on the principles agreed upon for ISDN. Intralata and Interlata carriers have entered into trials of

²Primary Rate Access is defined as a standard combination of digital access channels that constitute the access arrangement. It employs a 1.544 mbps facility typically divided into 23B channels and 1D channel.

³Exchange Carrier Standards Association, ANSI Committee T1E1 and The International Telegraph and Telephone Consultative Committee (CCITT).

⁴This filing addresses only layer one, the physical layer of the Open System Interconnection (OSI) reference model.

that equipment. Recently, the American National Standards Institute (ANSI) approved a standard⁵ for BRA ISDN. That document standardized the two wire echo canceler with hybrid technology for the transmission of BRA services.⁶ This petition is based on the ANSI standard.

DESCRIPTION

The proposed amendments to Part 68 cover the generic requirements for the connection of terminal equipment at the customer BRA interface. The attached Appendix sets forth the proposed changes to Part 68. The proposed specific text is intended to protect the network from harm.⁷ In some cases no Part 68 amendments have been proposed as the present wording is applicable to terminal equipment connecting to ISDN BRA. The following examines

⁵ANSI T1.601, 1988, Integrated Services Digital Network-Basic Access Interface for use on Metallic Loops for Application on the Network Side of NT - Layer 1 Specification.

⁶Echo cancellation is a technique for implementing a digital subscriber line (i.e., BRA) in which a record of the transmitted signal is used to remove echoes of the signal that may have mixed with and corrupted the received signal. (ANSI T1.601)

⁷Harm is defined as electrical hazards to telephone company personnel, damage to telephone company equipment, malfunction of telephone company billing equipment, and degradation of service to persons other than the user of the subject terminal equipment, the respective calling or called party. 47 C.F.R. Section 68.3.

each Subpart of the Rules and how this proposal will apply to ISDN BRA:

Subpart A includes sections on "Purpose," "Scope," "Definitions" and "Hearing Aid Compatibility." The adoption of this proposal for ISDN BRA is within the stated Purpose of the Rules.⁸ However, in order for ISDN BRA to be included under Part 68, the Scope must be modified to specifically state that terminal equipment connected to ISDN BRA is covered by the Rules. ISDN standards allow for the functions addressed in Part 68 to be provided by multiple pieces of CPE. Thus, the attached modifications additionally apply to CPE providing ISDN functions connected to two wire BRA through other pieces of CPE. The attached Appendix contains language [Section 68.2(a)(10)] that is proposed to include the two wire BRA interface in Part 68. A second modification is proposed [Section 68.2(k)] to "grandfather" any terminal equipment connected prior to the adoption of the proposed Part 68 amendments. In addition, a definition of the ISDN BRA Interface [Section 68.3] is proposed to identify the interface leads where the applicable requirements would apply. No modifications to the Hearing Aid Compatibility section are being proposed. Manufacturers of equipment connecting to ISDN BRA will have to meet the hearing aid requirements as applicable.

⁸47 C.F.R. Section 68.1.

Subpart B, "Conditions on use of Terminal Equipment," and Subpart C, "Registration Procedures," impose the conditions for the connection and use of terminal equipment. No modifications are proposed to these Subparts to add ISDN BRA. The present language is considered to be applicable to all terminal equipment covered in the Scope of the Rules.

Subpart D, "Conditions for Registration," outlines the technical parameters that terminal equipment must meet in order to be registered. Section 68.300, "Labeling Requirements," outlines the labeling requirements for registered equipment. Adoption of the proposed rule amendments would require ISDN BRA terminal equipment to meet these requirements. Section 68.302, "Environment Simulation," specifies the mechanical and electrical stresses which terminal equipment is required to meet for registration. Adoption of the proposed Part 68 amendments would require terminal equipment connected to ISDN BRA to meet these requirements. Section 68.304, "Leakage Current Limitations," and Section 68.306, "Hazardous Voltage Limitations," would also correctly apply to terminal equipment connected to ISDN BRA as written.

Based on the ISDN BRA ANSI Standard,⁹ no specific signal power requirements are being proposed. The manner in

⁹ANSI T1-601.

which the echo cancellation technology will be implemented, as specified in the ANSI standard, will place adequate controls over the signal power output of the terminal equipment.¹⁰ However, Sections 68.308(h)(1)(iv) and 68.308(h)(2)(v) both contain a requirement on the encoded analog content of the digitally encoded messages that may be decoded within the network and delivered to an analog terminal. Terminal equipment connected to ISDN BRA can encode analog signals at higher signal power levels than allowed by Part 68. Thus, an additional section [Section 68.308(h)(3)] is proposed to control the encoded signals from ISDN BRA terminal equipment.

In Section 68.310, "Longitudinal Balance Limitations," a new section [Section 68.310(k)(2)] and a related figure [Figure 68.310(k)(2)] are proposed to prevent harm from crosstalk. Section 68.312, "On-Hook Impedance Limitations," does not apply to ISDN BRA.¹¹ Section 68.314, "Billing Protection," contains billing protection requirements that terminal equipment must meet in order to be registered. Sub-Section 68.314(f) sets forth the

¹⁰The echo cancellation technology requires that the Central Office equipment and the remote equipment must interact at the same signal levels. Any differences render the service inoperable.

¹¹ISDN BRA does not have a traditional ringer equivalence requirement as compared to conventional terminal equipment. Thus, no requirements are proposed for on-hook impedance.

requirements for 1.544 Mbps and Subrate digital services. The requirements for ISDN BRA terminal equipment are the same and a modification to this sub-section is proposed to specifically include terminal equipment connected to ISDN BRA.

Section 68.316, "Hearing Aid Compatibility Technical Standards" would apply to terminal equipment connected to ISDN BRA. No additional requirements are proposed in Section 68.318, "Additional Limitations," or in Subpart E, "Complaint Procedures."

The ANSI Standard specifies an eight (8) position non-keyed miniature modular jack. The ISDN BRA service connects to pins 4 & 5. This would require the adoption of a new registration jack wiring configuration for ISDN BRA. Adoption of this new configuration should be accomplished through the tariff alternative specified in Section 68.104(C).¹²

Because of the varied implementations of equipment used in the trials and early applications of ISDN BRA, full grandfathering privileges should only be granted to those equipments that conform to the ANSI BRA Standard. Full grandfathering would allow qualified equipment to be moved

¹²The tariff alternative is the process by which the FCC adopts connector configurations for the connection of terminal equipment to the network, by an industry consensus process. This process was implemented by the FCC to speed up the adoption of connector configurations which would otherwise be involved in lengthy rulemaking proceedings.

and/or reconnected to any standard ISDN BRA interface. Limited grandfather connection privileges, such as connection in place and reconnection to a compatible ISDN BRA, subject to availability, should be granted to non-standard terminal equipment as this equipment would not be universally compatible with standard ISDN BRA. In addition, the Commission should establish a transition period of at least 18 months to allow manufacturers time to comply with the Part 68 two wire BRA requirements.


CONCLUSION

Many parties in the industry are concerned about the applicability of Part 68 to ISDN Basic Access. Adoption of this proposal will eliminate that concern by defining requirements for Part 68 and allow the industry to move forward toward the implementation of ISDN.

Respectfully submitted,

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APPENDIX

PROPOSED REVISIONS
TO
PART 68
FOR
ISDN BASIC RATE ACCESS

Changes proposed herein by Southwestern Bell Telephone Company are shown in this Appendix as amendments to the existing Part 68 Rules. Changes are shown in the following manner:

- (1) Wording to be deleted is lined out.
e.g., ~~words/words~~
or by indicating

1
1
(delete)
1
1

- (2) Wording to be added is underlined
e.g., words words
or by indicating

1
1
(new)
1
1

Underlining presently included in the rules for heading and emphasis has been deleted for clarity.

- (3) The designation

indicates that text material in existing or proposed Part 68 rules has been skipped but is unchanged.

Section 68.2 (a) Scope

Proposed Rule

(a) General. Except as provided for in paragraphs (b), (c), (d), (e), (f), (g), (h), (i), (j), and (k) the rules and regulations in this Part apply to the direct connection:

new (10) of all terminal equipment to the Integrated Services
1 Digital Network (ISDN) Basic Rate Access (BRA).

Rationale

The proposed subparagraph (10) expands the Scope of Part 68 to include the connection of terminal equipment to ISDN BRA, including all equipment necessary to derive said two wire BRA interface.

Proposed Rule

- 1 (k) Grandfathered terminal equipment for connection to ISDN
1 BRA:
1
1 (1) All terminal equipment, including its premises
1 wiring and protective apparatus (if any), directly
1 connected to ISDN BRA on (grandfather eligibility
1 date) may remain connected for life without
1 registration, unless subsequently modified.
(new)
1 (2) New installations of terminal equipment, including
1 premises wiring and protective apparatus (if any),
1 may be installed up to (register only date) without
1 registration of any terminal equipment involved,
1 provided that these terminal equipments are of a
1 type that was directly connected to a standard ISDN
1 BRA as of the (grandfather date). These terminal
1 equipments may remain connected for life without
1 registration, unless subsequently modified.

Rationale

Although ISDN BRA is a new technology, the implementation of field trials which connected eligible terminal equipment prior to the adoption of Part 68 Rules requires that an allowance for grandfathering be adopted. However, non-standard ISDN BRA terminal equipment should only be grandfathered in place, as it does not conform to the ANSI standard. An eighteen month transition period should be approved to allow for registration of terminal equipment.

Section 68.3 Definitions

Proposed Rule

- 1 ISDN Basic Rate Access Interface: A two wire, full-duplex echo
- 1 canceler hybrid interface between the terminal equipment and
- (new) ISDN BRA. The tip and ring leads shall be treated as
- 1 telephone connections for the purpose of fulfilling
- 1 registration conditions.

Rationale

The interface leads for ISDN BRA terminal equipment are identified so appropriate registration requirements can be applied.

Section 68.308 Signal Power Limitations

Proposed Rule

Section 68.308 (h) (3)

- 1 (3) Limitations on terminal equipment connecting to ISDN BRA:
1
1 If registered terminal equipment connecting to ISDN BRA
1 services contains a digital-to-analog converter, or generates
1 signals directly in digital form, which are intended for
1 eventual conversion into voiceband analog signals, the
(new) encoded analog content of the digital signal must be limited.
1 The maximum equivalent power of the encoded analog signals,
1 other than live voice, as derived by a zero-level decoder
1 test configuration, shall not exceed -12dBm when averaged
1 over any three-second interval. The maximum equivalent power
1 of encoded analog signals, as derived by a zero-level decoder
1 test configuration, for network control signalling, shall not
1 exceed -3 dBm when averaged over any 3 second interval.

Rationale

The proposed rule will extend the encoded analog content protection to ISDN BRA. Digital encoders can encode signals at higher than the allowed signal power and transmit those signals digitally into the network. This requirement is proposed because ISDN BRA messages will be decoded in the network in order to be delivered to an analog terminal.

Section 68.310 Longitudinal Balance Limitations

Proposed Rule

1 (m) For ISDN BRA

1 The Longitudinal balance (impedance to
1 ground) is given in the following equation:

1
1
1
1
1
1
1
1
1
1

$$\text{LBal} = 20 \log \left| \frac{e_i}{e_m} \right| \text{ dB}$$

(new)

1 where

1 e_i = the applied longitudinal voltage (referenced to
1 the building or green wire ground of the NT)

1 e_m = the resultant metallic voltage appearing
1 across a 135-ohm termination.

1 The balance shall be > 20 dB at frequencies up to 5 Hz. The minimum
1 requirement increase above 5 Hz at 20 dB per decade to 55 dB at 281.2
1 Hz. The balance shall be > 55 dB between 281.2 Hz and 40000 Hz.
1 Above 40000 Hz, the minimum requirement decrease at 20 dB per
1 decade. See Figure 21.

Rationale

The proposed longitudinal balance requirements for terminal equipment connected to ISDN BRA is necessary to control the amount of crosstalk in the cables.

Section 68.314 Billing Protection

Proposed Rule

- 1 Section 68.314 (f) On-hook signal requirements for registered
(new) terminal equipment for connection to ISDN BRA, substrate or 1.544 Mbps
1 digital services.

Rationale

ISDN BRA will be interconnecting with the analog network to transmit and receive messages from ISDN BRA terminal equipment to non-ISDN terminal equipment. The proposed rule would require that manufacturers provide the proper billing information when interacting with the network. This requirement will assure that ISDN BRA terminal equipment will provide for the proper billing of ISDN calls.

LONGITUDINAL BALANCE REQUIREMENTS FOR ISDN BASIC RATE ACCESS

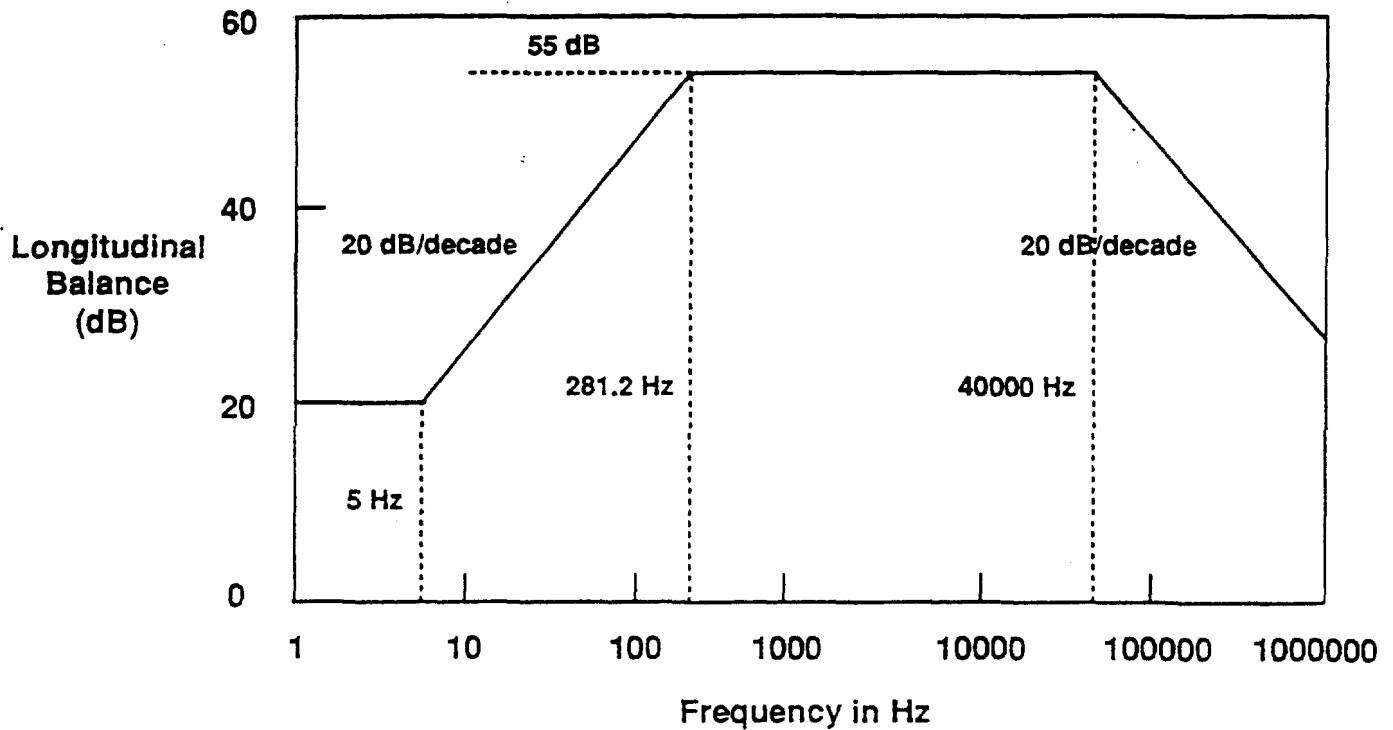



Figure 68.310 (m)

Minimum Longitudinal Balance Requirement

CERTIFICATE OF SERVICE

I, Tracey L. Doneff, hereby certify that the foregoing "Petition for Rulemaking" in the Matter of Petition to Amend Part 68 of the Commission's Rules to Include Terminal Equipment Connected to Basic Rate Access Services Provided via Integrated Services Digital Network Access Technology has been served this 23rd day of August to the Parties of Record.


Tracey L. Doneff

August 23, 1991

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